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A basic skills program designed for first- to sixth-grade students who were underachieving in reading or arithmetic was evaluated. The program was designed to raise the students' levels of achievement and to improve their attitudes toward learning. A staff development program designed to introduce teachers to new methods of teaching basic skills, to encourage their use of them, and to provide them with a better understanding of how to teach these skills was also evaluated. Three experimental reading methods were used: the Imperial Productions Self-Directive Program, the Stern Structured Linguistics, and the Sullivan Programed Reading. Two nonexperimental methods were also used: traditional phonics and eclectic approaches. Presession and post-session questionnaires, the Botel Phonics Inventory, the Reading subtest of the Metropolitan Achievement Test, and other tests were administered. It was concluded that all post-test means were significantly higher than pretest means. None of the five reading methods was significantly better than the others. Teachers using experimental methods were resistant to change. The importance of teacher involvement in curriculum development and change was established. A list of references, an appendix, numerous tables, and a review of related research are included. (RT)

THE SCHOOL DISTRICT OF PHILADELPHIA
Office of Research and Evaluation
Department of Instructional Research and Development

Final Report on the 1967 Summer Basic Skills Program

Prepared by

David Gray, Research Associate

U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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John L. Hayman, Jr., Executive Director

William C. Theimer, Jr., Assistant Director

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I. Overview and Summary of Findings.

The Basic Skills Program held in the Philadelphia schools during the Spring and Summer of 1967 consisted of staff development for teachers and remediation in reading and arithmetic for first through sixth grade pupils underachieving in those subjects. Data were collected on pupils' achievement and attitudes, teachers' attitudes and teachers' professional judgments of staff development.

1. For pupils, the main purpose of the program was successfully accomplished. Without exception, all measures of reading and arithmetic achievement showed significant gain.

2. No method of instruction emerged as clearly superior to any other method.

3. No measurable attitude changes occurred for either pupils or teachers.

4. The greatest weakness of the program was staff development. Questionnaire data collected from teachers suggest two ways in which future staff development programs can be improved.

The first indicated change is initiating recruitment early enough for all teachers to receive their appointments in time to take advantage of the staff development.

The second indicated change is in format and content. Teachers stated a decided preference for workshops, which allow greater individual participation and which provide more opportunities for one to become familiar with materials and procedures to be used in the classroom. Research on methods for inducing behavioral change show that the type of program most likely to be effective is the one teachers themselves advocated.

5. Lateness in getting started weakened the program in other ways. Included in these was the late arrival of books and supplies at many schools.

II. Introduction

In June and July, 1967, The School District of Philadelphia had a five-week remedial program in basic reading and mathematics skills. Eligible for the program were lower and middle school pupils (grades 1 through 6) who were more than one year retarded in these skills and who were judged capable of performing at their proper grade-levels. Beyond the immediate purpose of raising their levels of achievement, the program was designed to improve their attitudes toward learning, and thus to influence their learning in future post-session situations.

Preceding the summer session, during May and June there was a staff development program. Teachers, lead teachers, reading and mathematics specialists and invited authorities on new techniques and materials in education participated. This pre-session program was designed to introduce teachers to new methods in teaching basic skills, to encourage their use of them and to provide them with a better understanding of how to teach basic skills.

Five reading methods were evaluated. Three of them are experimental. These are the Imperial Productions self-directive program (which uses tapes and pupil response booklets); the Stern structured linguistics (which is combined with phonics); and the Sullivan programmed reading (which uses a visual approach). Schools using either of two non-experimental methods, traditional phonics and eclectic approaches, served as a control group.

In the middle grades (5 and 6), some schools had Madison Project Mathematics Laboratories. These labs present the so-called "new math" by means of discovery learning techniques. Schools without labs served as a control group.

The innovative materials and techniques evaluated are the following:

.televised instruction, used in conjunction with the regular teaching of reading.

.listening centers, electronic devices with attached earphones permitting groups of 4 to 8 children to hear lessons, stories and directions requiring attention for subsequent performance of a task.

.Instructional Materials Centers containing books, tapes, records, filmstrips, games and other things to be used in the instruction of children.

.films, filmstrips and tapes used in remedial reading.

.the computing abacus, a device for giving children visual and graphic understanding of arithmetic concepts.

.the 100-chart, a display device for teaching facts about numbers.

.the Number Line, a device with which concepts relating to the number system can be demonstrated.

.Modern Mathematics Worksheets by Albert Filano

.Modern Math for Achievement, worksheets especially designed for underachievers in the middle grades.

.Cuisenaire rods, a set of materials used in the development of arithmetic concepts.

.transparency originals, which can be projected on a screen to present new concepts or summarize what has been learned.

Another innovation involved personnel. Lead reading and arithmetic teachers worked with principals and teachers to assist them in diagnosing pupils' difficulties, developing teaching procedures, demonstrating new materials and techniques and coordinating school-wide activities.

III. Review of Related Research

Research on the relative effectiveness of instructional methods typically have yielded non-significant results. Harris (1962, 1964) revieved research on remedial reading programs conducted during the school years 1960-61 and 1962-63 and concluded that substantial gain usually results from short-term programs. Morris (1958) criticized research on remediation on the grounds that smaller-than-ordinary class size almost guarantees positive results no matter what methods are used. Summers and Hubrig (1966) revieved doctoral dissertations written in 1963 and found that 15 of 17 studies relating reading methods to achievement had non-significant results. Similar non-significance was reported by Anderson, Hughes and Dixon (1956). Siegel and Siegel (1967), commenting on the designs of research in education, noted that the absence of significant differences between control and experimental groups is common.

The second aspect of the program was staff development. Research on the acceptance of change indicates that it is facilitated by getting people personally involved with the change (Lewin, 1958; Coch and French, 1948) and by making them aware of its value (Kelly, 1960; Rogers, 1962). The first three of these studies involved housewives, factory workers and farmers, respectively, but are pertinent in that they illustrated principles applicable in all areas of social behavior. Kelly provided more immediately usable information; he found that teachers who had been trained in the use of new audiovisual equipment accepted it more readily than those who lacked this training.

Another line of inquiry relevant to the present study concerned teacher effectiveness. Taylor (1961) found that additional training in subject matter was the major concern of recent college graduates on their first teaching assignment. Mitzel and Medley (1957) found that differences in reading improvement among pupils of beginning teachers were directly attributable to teacher effectiveness. Kerfoot (1967) reviewed 27 investigations of first grade reading methods and concluded that teacher effect is far greater than method effect and that improvement in reading instruction is more likely to result from improvement in teacher effectiveness than from any change in methodology.

III. Procedures

A. Samples selected.

To avoid overtesting any one set of children, reading and arithmetic achievement tests were administered to separate samples. Because of the excessive amount of time needed to administer both arithmetic tests, the arithmetic samples were divided for the posttest administration, each subsample receiving only one of the two tests.

1. The first and third grade reading samples.

Reading achievement and attitude tests were administered to all first and third grade pupils in 20 schools. Selection of these schools followed a 2 x 5 design with 2 schools per cell. Social class had 2 levels: Lower and Middle. Reading method had 5 levels: Eclectic, Traditional Phonics, Imperial, Stern and Sullivan.

Selection of the specific schools to be used was made by the Summer School Committee. Their classifications of schools as Lower or Middle Class were verified by 1960 census data for the census tract in which each school was located.

The schools from which data were actually collected are these:

Reading Method	Lower Class	Middle Class
Eclectic	Adaire Jefferson	H. Edmunds Lawton
Traditional Phonics	Childs McKinley	Barton Fell
Imperial	none*	Holme Morton
Stern	Drew Fulton	F. Edmonds Morrison
Sullivan	Kearny Reynolds	Mitchell Finletter

*Dunbar and Nebinger were originally included. Dunbar participated in an experimental study run by Temple University. The Office of Research and Evaluation was not informed of this until mid-July, at which time it was too late to substitute another school. Material from Nebinger was either not returned or lost in transit.

2. The fifth grade reading sample.

The fifth grade reading sample consists of all classes in 8 schools, also stratified by reading method and social class. These are:

Reading Method	Lower Class	Middle Class
Eclectic	Strawberry Mansion	Bustleton
Imperial	Audenried	FitzPatrick
Stern	Gillespie	Hopkinson
Sullivan	Bartlett	W. Wilson

3. The third grade arithmetic sample.

All classes in 22 schools were administered an attitude test and either the Concepts or the Computation subtest of the Stanford Diagnostic Arithmetic Test. The 10 schools receiving the Concepts subtest are Alcorn, Barry, Creighton, Dick, S. Douglas, Jackson, Kelley, McCall, Pennell and Wright. The 12 receiving the Computation subtest are Bridesburg, Decatur, F. Douglass, Dunlap, Heston, Hanna, Kirkbride, Levering, Mayfair, Morris, Southwark and Whittier.

As these schools were not stratified on any independent variable, analyses were limited to differences between pretest and posttest scores.

4. The fifth grade arithmetic sample.

All classes in 10 schools, half of which had Madison Project Laboratories, were also administered an attitude test and either the Concepts or the Computation subtest mentioned above. The Concepts subsample consists of 3 Lab schools, Furness, Leeds and Shoemaker, and one Control school, Tilden. The Computation subsample consists of 2 Lab schools, Harding and Masterman, and 4 Control schools, Beeber,

Stoddart-Fleisher, Vare Junior High School and Mifflin.

5. The teacher sample.

An attitude test was administered to all first, third and fifth grade teachers whose classes were included in any of the 5 pupil samples.

6. The teacher questionnaire sample.

The post-session questionnaire was administered to all first, third and fifth grade teachers throughout the city, whether their classes were in a pupil sample or not. Data were collected from 118 schools.

Note: Wherever classes were ungraded and formed on the basis of pupils' level of mastery of reading and arithmetic, the summer school principal selected those classes which contained mainly first, third or fifth graders, as the case may be.

B. Instruments used.

Except for the Post-Session Questionnaire, all instruments were administered at the beginning and again toward the end of the five-week session.

1. The Botel Phonics Inventory was administered to the first, third and fifth grade reading samples. Each pupil's score was the number of correct responses he made.

2. The Reading subtest of the Metropolitan Achievement Test was administered to the third and fifth grade reading samples. Third graders received the Upper Primary level of the test and fifth graders, the Elementary level. For both grades, alternate forms of the test were used to minimize practice effect. About half of each sample received one form for the pretest and the other for the

posttest, while the other half received the same forms, but in reversed order.

3. The Concepts and Computation subtests of the Stanford Diagnostic Arithmetic Test, Level II, were administered to the third and fifth grade arithmetic samples, as noted in the preceding section.

4. The Activities Preference Test, a measure of attitudes toward reading and arithmetic, was administered to the first and third grade reading and arithmetic samples. The test, which was locally constructed for use in this study, was adapted from one constructed by Gurney (1966). Forced-choice items, each containing a pair of activities, were used. The pupil's score on the Reading Attitude scale consisted of the number of items on which he stated a preference for a reading-related activity over a non-scholastic activity. Similarly, his Arithmetic Attitude score was the number of items on which he chose an arithmetic-related activity. As many children in these samples were preliterate, the two alternatives in each item were illustrated. The pupil indicated his responses by circling pictures of children performing the activities he himself preferred.

5. The Middle School Survey, a test also measuring attitudes toward reading and arithmetic, was administered to the fifth grade reading and arithmetic samples. The Reading Attitude scale, which was originally titled the San Diego Inventory of Reading Attitude, was constructed and validated in California (San Diego County Department of Education, 1961). The Arithmetic Attitude scale was a Likert scale on which the pupil stated how much he liked or disliked various arithmetic-related activities. A five-point scale, ranging from Like Very Much to Dislike Very Much, was used. Buffer items were included in the list of activities, but were not scored.

6. The Summer Program Adjective Checklist, a semantic differential, was administered to all teachers who had classes in the 5 pupil sample. The semantic differential is a technique for measuring differences in the connotative meanings of words and was devised by Osgood and his colleagues (1957). Teachers rated 7 concepts, 4 of them general (Teachers, School Children, Myself and Summertime)

and 3 of them particular to the Basic Skills Program (Teachers in This Program, School Children in This Program and Methods Used in This Program), on the 3 major factors found by Osgood. These factors are Evaluation (a good-bad dimension), Potency (a strong-weak dimension) and Activity (an active-passive dimension).

7. All first, third and fifth grade teachers were administered the Post-Session Questionnaire. This instrument used a multiple-choice, sentence-completion format. ("I am (a) male; (b) female.") Data were collected from 118 of the approximately 140 schools open during the summer of 1967. Topics covered in the questionnaire included personal and professional characteristics of the respondents; experiences they had in the 1967 Basic Skills Program; their opinions about staff development and instructional methods and materials; and their observations and opinions about their pupils. Teachers were allowed to supplement their responses to the items in the questionnaire with free comments and explanations. The latter source of information proved as valuable as the precoded items themselves.

IV. Findings

A. Achievement tests for pupils.

In all 5 samples, all posttest means on the achievement measures used were significantly higher than the pretest means. This seems to be conclusive evidence that children did benefit from the 5 weeks of instruction they received. These data are presented in Tables 1 and 2.

Table 1.

Achievement Scores for the Reading Samples

Grade	Instrument	N	Pretest Mean	Posttest Mean	t	p
1	Phonics Inventory	237	8.11	10.34	3.27	.001
3	Phonics Inventory	375	37.15	41.84	4.60	.001
3	Metropolitan	457	28.13	29.24	2.31	.02
5	Phonics Inventory	689	47.72	51.67	5.98	.001
5	Metropolitan	586	24.88	26.97	3.67	.001

Table 2.

Achievement Scores for the Arithmetic Samples

Grade	Subtest*	N	Pretest Mean	Posttest Mean	t	p
3	Computation	308	21.40	24.12	7.54	.001
3	Concepts	364	35.40	40.64	11.67	.001
5	Computation	446	48.38	51.22	5.74	.001
5	Concepts	330	45.53	52.43	13.26	.001

* of the Stanford Diagnostic Arithmetic Test.

All 3 reading samples were stratified by social class. On all tests administered, analyses of variance showed that middle class children had significantly higher pretest means than did lower class children. Furthermore, on all tests but one (Metropolitan Achievement Test for fifth graders), analyses of covariance showed that middle class children had significantly

higher gain-scores. Like many variables included in the present study, class differences tell us little about the Basic Skills Program, but are valuable as a check on the validity of measures used. Pretest, posttest and adjusted reading achievement test means are in Table 3.

Table 3

Achievement Scores for the Reading Samples by Social Class

Grade	Social Class	Instrument	Pretest Means	Posttest Means	Adjusted Means
1	Lower	Phonics Inventory	7.27	9.17	11.25
1	Middle	Phonics Inventory	11.87	14.86	12.78
3	Lower	Phonics Inventory	30.88	34.22	38.03
3	Middle	Phonics Inventory	40.81	46.28	42.48
3	Lower	Metropolitan	24.50	24.81	27.63
3	Middle	Metropolitan	31.65	33.58	30.78
5	Lower	Phonics Inventory	42.83	46.01	49.23
5	Middle	Phonics Inventory	53.11	57.80	54.58
5	Lower	Metropolitan	21.40	24.79	26.86
5	Middle	Metropolitan	27.46	28.06	25.99

The same reading samples were also stratified by method of instruction. For the first and third grade samples, no differences attributable to method of instruction were found on any achievement test. Analyses of covariances of tests taken by fifth graders showed significantly greater gain on the Phonics Inventory for pupils taught by the Eclectic and Stern methods and on the Metropolitan Achievement Test for pupils taught by the Stern method. Pretest, posttest and adjusted means are in Table 4.

Table 4.

Achievement Scores for the Fifth Grade Reading Sample by Method of Instruction

Method	Instrument	Pretest Means	Posttest Means	Adjusted Means
Eclectic	Phonics Inventory	50.21	55.96	54.55
Imperial	Phonics Inventory	48.78	49.96	49.45
Stern	Phonics Inventory	44.07	50.55	52.99
Sullivan	Phonics Inventory	48.81	51.15	50.62
Eclectic	Metropolitan	25.49	23.81	23.16
Imperial	Metropolitan	22.87	23.91	25.01
Stern	Metropolitan	24.46	31.83	31.12
Sullivan	Metropolitan	23.91	26.06	26.41

Determination of interaction between social class for the first and third grade samples was not possible due to data missing from the Dunbar and Nebinger schools. For the fifth grade sample, interactions between these two variables on both achievement measures were not statistically significant.

Analyses of covariance was used to compare Laboratory and Non-Laboratory schools in the fifth grade arithmetic sample. On the Computation subtest of the Stanford Diagnostic Arithmetic Test, the Lab schools had significantly lower gain. No significant difference was found on the Concepts subtest. Means on the former measure are in Table 5.

Table 5.

Scores on the Computation Subtest, S.D.A.T., for Fifth Graders

Treatment	Pretest Mean	Posttest Mean	Adjusted Mean
Laboratory	49.70	50.37	49.51
Non-Laboratory	47.35	51.88	52.75

B. Attitude tests for pupils.

When the Activities Preference Test was administered nothing was known about its reliability or validity, other than its having face validity and appearing to measure what it is supposed to. After pretest and posttest data had been collected, a 2 x 2 analysis of variance was done on scores made by 200 randomly selected pupils. Sex and grade both had 2 levels and there were 50 pupils in each cell. On the Reading Attitude scale, third graders scored significantly higher than first graders, and there was a non-significant trend for girls to score higher than boys. On the Arithmetic Attitude scale, boys scored significantly higher than girls, and there was a non-significant trend for third graders to score higher than first graders.

Tyler (1956), who reviewed studies on age and sex differences, reported findings similar to these. Girls, for example, had greater interest in reading and boys, in mathematical and mechanical activities. Even though the Activities Preference Test still must be regarded as experimental, we have greater confidence in its validity. Data are presented in Tables 6, 7 and 8.

Table 6.

Mean Scores on the Activities Preference Test

	Reading	Arithmetic	N
First Grade Boys	8.42	11.04	50
" " Girls	9.20	9.26	50
Third Grade Boys	9.42	11.48	50
" " Girls	10.02	9.76	50

Table 7.

Analysis of Variance on Reading Attitude Scores

Source of Variation	Sum of Squares	df	Mean Squares	F	p
Sex	23.85	1	23.85	2.73	NS
Grade	41.45	1	41.45	4.74	.05
Sex by grade	0.40	1	0.40	0.05	NS
Within groups	1713.40	196	8.74		
Total	1779.10	199			

Table 8.

Analysis of Variance on Arithmetic Attitude Scores

Source of Variation	Sum of Squares	df	Mean Squares	F	p
Sex	153.13	1	153.13	16.63	.001
Grade	11.05	1	11.05	1.19	NS
Sex by grade	0.04	1	0.04	0	
Within groups	1832.00	196	9.21		
Total	1996.22	199			

On measures of attitude toward reading administered to 4 of the 5 samples and on measures of attitude toward arithmetic administered to all 5 samples, pretest and posttest means were almost identical. The one exception was the fifth grade arithmetic sample in which there was a significant drop on the Reading Attitude scale of the Middle School Survey. When a large number of measures are used, significant differences can occur by chance. This seems to be the case here. Thus, the evidence seems conclusive that no changes of attitude took place. These data are presented in tables 9 and 10.

Table 9.

Reading Attitude Scores*

Sample	N	Pretest Mean	Posttest Mean	t	p
First Grade Reading	328	8.23	8.11	0.48	NS
Third Grade Reading	452	9.17	9.37	0.56	NS
Third Grade Arithmetic	658	9.86	9.29	0.52	NS
Fifth Grade Reading	554	15.04	14.54	0.55	NS
Fifth Grade Arithmetic	625	15.35	14.70	3.82	.001

* Activities Preference Test for Grades 1 and 3; Middle School Survey for Grade 5.

Table 10.

Arithmetic Attitude Scores*

Sample	N	Pretest Mean	Posttest Mean	t	p
First Grade Reading	332	10.04	9.91	0.16	NS
Third Grade Reading	441	9.75	10.12	0.54	NS
Third Grade Arithmetic	668	10.63	10.47	1.93	NS
Fifth Grade Reading	542	43.01	42.35	0.73	NS
Fifth Grade Arithmetic	614	44.54	43.46	1.75	NS

* Activities Preference Test for Grades 1 and 3; Middle School Survey for Grade 5.

Analyses of covariance across methods of instruction and social classes also showed almost completely negative results.

C. An attitude test for teachers.

The semantic differential, which was filled in by 184 teachers, yielded 21 measures: 7 concepts on 3 scales. For 19 of these 21 measures, pretest and posttest means were not significantly different from one another. Teachers as well as pupils apparently experience no changes of attitude. The data are in Table 11.

Table 11.

Summer Program Adjective Checklist (a semantic differential)

Concept	Scale	Pretest Mean	Posttest Mean	t	p
School children	Evaluation	18.55	18.48	0.70	NS
School children	Potency	15.53	15.90	0.19	NS
School children	Activity	18.10	18.20	0.64	NS
Teachers	Evaluation	19.52	19.57	0.91	NS
Teachers	Potency	17.76	17.76	0	NS
Teachers	Activity	18.28	18.29	0.07	NS
Summertime	Evaluation	14.83	17.08	3.21	.01
Summertime	Potency	16.08	16.03	0.41	NS
Summertime	Activity	16.83	16.11	0.21	NS
School children in this program	Evaluation	17.90	18.11	0.22	NS
School children in this program	Potency	14.74	15.84	1.86	NS
School children in this program	Activity	16.63	17.40	0.67	NS
Methods used in this program	Evaluation	20.10	19.43	0.89	NS
Methods used in this program	Potency	16.69	16.69	0	NS
Methods used in this program	Activity	14.98	17.32	2.60	.02
Teachers in this program	Evaluation	19.80	19.51	0.90	NS
Teachers in this program	Potency	17.49	17.39	0.54	NS
Teachers in this program	Activity	17.66	18.71	1.53	NS
Myself	Evaluation	20.27	20.27	0	NS
Myself	Potency	16.58	17.22	0.44	NS
Myself	Activity	18.54	18.48	0.70	NS

To determine whether concepts were rated differently on each of the 3 scales, one-way analyses of variance were done on pretest scores. Significant differences were found on the Evaluation scale ($F = 5.64$, $P < .01$) and the Potency scale ($F = 7.51$, $p < .01$), but not on the Activity scale.

The significant F-ratios tell us that one or more concepts were rated significantly differently from the others, but they do not indicate which these concepts are. For that purpose Newman-Keuls tests were performed on the Evaluation and Potency scale data. On the Evaluation scale one concept, Summering, was rated significantly lower than any other concept; no significant difference was found among the 6 other concepts. In absolute terms, Summering received a negative rating and all other concepts, positive ratings.

Jakobovits (1968), who has been involved with several cross-cultural studies in psycholinguistics, found that Summer is universally evaluated highly. A clue to the low evaluation given this concept by teachers is the significantly higher evaluation they gave it on the posttest rating. The concept's referent had changed in the interim. On the pretest, it meant about a month of work and on the posttest, about a month of vacation. Support for this interpretation was provided by the free comments teachers made in response to the questionnaire. Many stated that the summer session was more enjoyable than they had anticipated, which implies that back in June they were not looking forward to it with great pleasure.

On the Potency scale, 4 distinct groupings were found: School Children in This Program was the weakest concept and School Children (in general), the second weakest; Methods Used in This Program, Summering and Myself were second strongest, while Teachers in This Program and Teachers (in general) were strongest of all. In absolute terms, School Children in This Program received a negative rating; School Children (in general), a neutral rating; and all other concepts, positive ratings.

These latter findings are useful as a check on the validity of the semantic differential. We have greater confidence in interpreting negative results as evidence that no attitude changes occurred rather than evidence that the instrument was insensitive to changes which actually may have taken place.

D. The questionnaire for teachers.

Data from the Post-Session Questionnaire are presented in 4 ways:

Responses of the entire sample of 601 teachers are presented first. Teachers not stating opinions or not providing information were excluded; in every case the percentages add up to 100%. To increase clarity, some items were paraphrased and some categories, combined. The actual percentages are in an appendix.

On selected items, chi-square analyses were made on fifth grade teachers in school with and without Madison Project Mathematics laboratories.

On selected items, chi-square analyses were made on differences between teachers in the 34 schools using an experimental reading method (Imperial, Stern or Sullivan) and those in the 67 schools using a control method (Eclectic or Traditional Phonics). Teachers in 17 other schools were excluded from these analyses.

On selected items, chi-square analyses were made on differences between teachers with less than 4 years' classroom experience (new teachers) and those with 4 or more years' experience (old teachers).

Although teachers are overwhelmingly in favor of staff development programs, almost half of them did not understand (or were not in sympathy with) the objectives of the program and two-thirds of them felt that the program was poorly planned. This response is partly attributable to recruitment difficulties. Almost half the teachers received their appointments too late for participation in the staff development program. Another contributing factor was the format of the program. Handwritten comments (supplementary to the questionnaire) indicated that teachers

would have much preferred workshops (rather than lectures) in which focus would have been on materials and procedures actually to be used in the classroom and in which greater individual involvement would have been possible.

Over 60% of the teachers claimed that background information on their pupils was useful to them. Responses, however, do not tell us how this information was used.

The majority of teachers followed the reading method assigned to them with some modification, felt that their preparation for using that method was excellent or good and would like to continue using the method in the future.

All but one of the innovative materials and techniques were favorably received by teachers. The one exception was televised instruction. Handwritten comments indicated that teachers consider television an excellent medium for instruction, but thought that the particular programs used last summer were poor. Television was rated excellent or good by 40% of the teachers, while other innovations received this rating from 69% to 86% of the teachers.

The item asking teachers whether they would modify their teaching of arithmetic was, unfortunately, worded ambiguously and can not be interpreted.

Teachers perceived their pupils as having improved in the mastery of reading and of arithmetic during the summer, which in fact they did. Comparing their summer session classes with classes they taught previously, teachers described the former as more interested in reading and in arithmetic, as less of a discipline problem and as equally receptive to learning. Handwritten comments indicated that teachers attributed this to smaller class size and the opportunity for more individual attention.

There were no significant differences between fifth grade teachers in Madison Project schools and in other schools on their perceptions of pupils' initial arithmetic level, end-of-session arithmetic level or interest in arithmetic. These data are not presented in table form.

Teachers using experimental reading methods showed considerable resistance to change. They were less likely to feel prepared for using that method, to desire to continue using it and to perceive achievement and interest in their pupils. These data are in Table 12.

Table 12.

Teacher's Perceptions of Reading Methods and of Pupils*

Variable	Experimental	Control	χ^2	df	p
Preparation for Method					
Excellent-good	97	202	50.00	1	.001
Fair-poor	138	78			
Desire to Continue Use					
Yes	138	221	18.80	1	.001
No	87	59			
Initial Reading Level					
At grade level	15	25	0.81	1	NS
Below grade level	209	257			
Final Reading Level					
At grade level	57	151	39.81	1	.001
Below grade level	163	129			
Interest in Reading					
More than average	101	191	36.95	1	.001
Same or less	134	83			

*N's for the various analyses are unequal due to missing data.

New teachers (those with less than 4 years' experience) were less likely to have used an experimental reading method. Despite this, they also were less acceptant of change and were less likely to feel adequately prepared and less likely to perceive improvement in reading among their pupils. They did, however, describe their pupils as more interested in reading. These data are in Table 13.

Table 13.

Relations between Classroom Experience and other Variables*

Variable	New Teachers	Old Teachers	χ^2	df	p
Reading Method					
Experimental	69	166	8.09	1	.01
Control	116	164			
Preparation for Method					
Excellent-good	78	221	29.96	1	.001
Fair-poor	107	109			
Desire to Continue Use					
Yes	119	240	3.37	1	NS
No	61	85			
Initial Reading Level					
At grade level	9	31	3.60	1	NS
Below grade level	175	291			
Final Reading Level					
At grade level	43	165	38.04	1	.001
Below grade level	139	153			
Interest in Reading					
More than average	120	172	6.12	1	.02
Same or less	66	151			

*N's for the various analyses are unequal due to missing data.

Although an item about the lead reading and arithmetic teachers was inadvertently omitted from the questionnaire, many respondents volunteered comments. The praise of the lead teachers was extensive and almost unanimous. They were highly regarded as individuals and the services they performed were described in terms ranging from "helpful" to "invaluable."

The majority of free comments took the forms of complaints and recommendations. One series of complaints had lateness as its theme. Staff development was perceived as a hastily put-together effort. Many teachers were notified of their appointments only a few days before the opening day of the session and were deprived of an opportunity to participate in staff development. Some teachers did not receive books and materials until the middle of the session, even though these were needed on the opening day. Recommendations for preventing recurrences of these problems all stressed getting started earlier.

Two complaints involved research. Many teachers complained that too much class time was taken up by testing. The staff of the Office of Research and Evaluation had not been fully aware of this problem. Testing in future curricula evaluations should be kept to the absolute minimum consistent with good research design.

A few teachers noted that a definitive evaluation of the various reading and arithmetic curricula should not be based on findings obtained from samples of underachievers. This is true. We still do not know how normally achieving children would perform when taught with these curricula during the regular school year.

Some children made almost perfect scores on pretest achievement tests. They were underachieving in either reading or arithmetic, but not in both. Teachers suggested excusing them from the subject in which they do not need special help and having electives such as art and music for them.

VI. Discussion

The basic purpose of the summer program was to raise the reading and arithmetic level of underachieving youngsters. In this regard, the program was an unqualified success. Without exception, every measure of achievement showed significant gain. In absolute terms, the gains were small, but they seem to have practical significance nevertheless. The amount of progress made by pupils in five weeks is encouraging.

All methods of instruction were found to be equally effective. One should not interpret this as meaning that all methods are equally good universally. Had the type of pupils included in the sample or the period of time during which pupils received instruction been changed, some methods might have conceivably been found to be more effective than others.

Interestingly, no measure of attitude showed significant change for either pupils or teachers. In this instance, learning was not dependent upon attitude change.

Teachers using experimental methods were resistant to change. The key to this problem may be the inadequate preparation reported by teachers who were using such a method and/or had less classroom experience. All social institutions must change to keep pace with cultural and technological developments. The school is no exception. Wherever change is initiated, the practical problem arises of how to get personnel to accept it. Fortunately, the teachers themselves requested the type of staff development program which has been empirically demonstrated to do this job best. The workshops which they want allow them to become more personally involved,

and to get direct feedback on how new methods and materials can be adapted to actual classroom situations they will face.

Probably, the most important and most practical result of this study is the realization that teachers need to be more fully involved in curriculum development and changes. Sarason (1967) found that the innovative intent of changes in education is often destroyed by the way in which teachers implement them. He attributed this to the self-defeating tendency for administrators to introduce changes by fiat and to fail to take into account the feelings and opinions of teachers.

VI. Appendix

Responses to the Post-Session Questionnaire (all percentages equal 100%).

1. Sex

Male	26%
Female	74

2. Age

29 or younger	42%
30 to 39	26
40 or older	32

3. Years of Classroom Experience

Less than 2 years	14%
2 to 4 years	21
More than 4 years	65

4. Previous Summer School Experience?

Yes	50%
No	50

5. Classroom Organization

Graded	39%
Ungraded	61

6. Appointment received early enough for participation in staff development?

Yes	55%
No	45

7. Was the preplanning for the program perceived as adequate?

Yes	32%
No	68

8. Do you recommend future staff development programs?

Yes	80%
No	20

9. Were the objectives of the Basic Skills Program clearly stated and realistic?

Yes	57%
No	43

10. Did you find the background information on pupils in your class to be useful?

Yes	62%
No	38

11. How carefully did you follow the reading method assigned to you?

With almost no modifications	23%
With some modifications	70
Not at all	7

12. How would you describe the preparation you received for using that method?

Excellent or good	55%
Fair or poor	45

13. Would you like to use that method during the regular school year?

As is or with few changes	71%
With many changes	15
Not at all	14

How would you rate each of the following?

	Excellent or Good	Fair or Poor
14. Television	40%	60%
15. Tapes	71	29
16. Films	72	28
17. Filmstrips	78	22
18. Listening centers	82	18
19. Instructional Materials Centers	81	19
20. Interdisciplinary approaches	71	29
21. Language laboratories	76	24
22. Computing abacuses	83	17
23. The 100-chart	82	18
24. The Number Line	86	14
25. Modern Mathematics Worksheets (by Filano)	80	20
26. Modern Mathematics for Achievement Worksheets	74	26
27. Cuisenaire rods	69	31
28. Transparency originals	72	28

29. At the beginning of the session, what was the reading level of the average pupil in your class?

At grade level	7%
Below grade level	93

30. At the end of the summer, what was the reading level of the average pupil in your class?

At grade level	27%
Below grade level	73

31. Compared with the interest pupils ordinarily have in reading, how would you describe those in your class?

More interest	65%
Same or less interest	35

32. At the beginning of the session, what was the arithmetic level of the average pupil in your class?

At grade level	7%
Below grade level	93

33. At the end of the summer, what was the arithmetic level of the average pupil in your class?

At grade level	32%
Below grade level	68

34. Compared with the interest pupils ordinarily have in arithmetic, how would you describe those in your class?

More interest	65%
Same or less interest	35

35. If you had any choice, which would you prefer to teach?

Underachievers	20%
Normally achieving pupils	58
Superior pupils	22

36. How much time did you spend disciplining children?

Less than usual	61%
Same or more than usual	39

37. Compared with pupils you taught previously, what was the receptivity to learning of those you had this summer?

More than usual	36%
Same as usual	32
Less than usual	32

18. Did you supplement your responses to this questionnaire with handwritten comments?

Yes	17%
No	83

One problem in the interpretation of the free comments was determining whether they represent the opinions of the majority or of a vocal minority. On the basis of the last item, writers and non-writers were differentiated and the responses compared. Patterns of response for the two groups were almost identical.

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